

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

see form PCT/ISA/220

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/JP2004/011954

International filing date (day/month/year)
13.08.2004

Priority date (day/month/year)
25.08.2003

International Patent Classification (IPC) or both national classification and IPC
F04B43/08

Applicant
SEIKO EPSON CORPORATION

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0 Tx: 523656 epmu d
Fax: +49 89 2399 - 4465

Authorized Officer

Olona Laglera, C

Telephone No. +49 89 2399-6941



**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/JP2004/011954

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
☐ a sequence listing
☐ table(s) related to the sequence listing
 - b. format of material:
☐ in written format
☐ in computer readable form
 - c. time of filing/furnishing:
☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/JP2004/011954

Box No. II Priority

1. ☒ The following document has not been furnished:

☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).

☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-22
	No: Claims	
Inventive step (IS)	Yes: Claims	1-22
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-22
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following document:

D1 : US - A - 3 182 602

V-1 The document D1, which is regarded as being the closest prior art to the subject-matter of claim 1, shows (the references in parentheses applying to D1):

A tube pump for transferring a fluid, comprising:

a tube (10) defining a flow path therein through which the fluid is transferred, the tube being capable of being deformed elastically, the tube having two opening/closing portions (tube portion between lower clamp 18 and clamp 22, tube portion between clamp 22 and upper clamp 18) provided at two spaced portions of the tube for opening and closing the flow path; and

two opening/closing mechanisms (22-24 and lower clamp 18, 22-24 and upper clamp 18) which are provided so as to correspond to the two opening/closing portions respectively for closing the flow path at the two spaced portions of the tube by folding the corresponding opening/closing portion of the tube and opening the flow path by unfolding the fold (13,14) of the opening/closing portion (cf. D1; column 1, line 51 - column 3, line 11; Figs.1-5).

The subject-matter of claim 1 differs from this known D1 in that, when one of the two opening/closing portions is further folded after closing the flow path at the corresponding portion of the tube by operating the corresponding opening/closing mechanism in a state where the other opening/closing portion is folded, an internal pressure in the tube between the two opening/closing portions is increased due to the further fold of the opening/closing portion, and the tube pump transfers the fluid using the increased internal pressure in the tube.

Therefore, the subject-matter of claim 1 is new (Article 33(2) PCT).

V-2 With regard to the subject-matter of independent claim 14, D1 shows the following features thereof (the references in parentheses applying to D1):

A tube pump for transferring a fluid, comprising:

a tube (10) defining a flow path therein through which the fluid is transferred, the tube (10) being capable of being deformed elastically, the tube (10) having two opening/closing portions (tube portion between lower clamp 18 and clamp 22, tube portion between clamp 22 and upper clamp 18) provided at two spaced portions of the tube for opening and closing the flow path; and the two opening/closing portions being arranged so as to face to each other through a predetermined space therebetween; and

an opening/closing mechanism (22-24) provided in the space between the two opening/closing portions respectively for closing the flow path at the portion corresponding to each of the two opening/closing portions by folding the tube at the opening/closing portion and for opening the flow path by unfolding the fold (13,14) of the opening/closing portion (cf. D1; column 1, line 51 - column 3, line 11; Figs.1-5).

The subject-matter of claim 14 differs from this known D1 in that, when one of the two opening/closing portions is further folded after closing the flow path at the corresponding portion of the tube by operating the opening/closing mechanism in a state where the other opening/closing portion is folded, the degree of fold of one opening/closing portion becomes differentiated from that of the other opening/closing portion so that an internal pressure of the tube between the two opening/closing portions is increased due to the further fold of the opening/closing portion, and the tube pump transfers the fluid using the increased internal pressure of the tube.

Therefore, the subject-matter of claim 14 is new (Article 33(2) PCT).

V-3 With regard to the subject-matter of the independent claim 21, D1 discloses (the references in parentheses applying to this document):

A tube pump for transferring a fluid, comprising:

a tube (10) defining a flow path therein through which the fluid is transferred, the tube being capable of being deformed elastically, the tube (10) having two

opening/closing portions (tube portion between lower clamp 18 and clamp 22, tube portion between clamp 22 and upper clamp 18) provided at two spaced portions of the tube for opening and closing the flow path; and

two opening/closing mechanisms (22-24 and lower clamp 18, 22-24 and upper clamp 18) which are respectively provided so as to correspond to the two opening/closing portions, one of the opening/closing mechanisms closing the flow path at one of the two spaced portions of the tube by folding (fold 13) the corresponding opening/closing portion of the tube and opening the flow path by unfolding the fold of the opening/closing portion (cf. D1; column 1, line 51 - column 3, line 11; Figs.1-5).

The subject-matter of claim 21 differs from this known D1 in that, the other opening/closing mechanism closes and opens the flow path at the other portion of the tube without folding and unfolding the corresponding opening/closing portion of the tube; and

when the opening/closing portion is further folded after closing the flow path at the corresponding portion of the tube by operating the corresponding opening/closing mechanism in a state where the other opening/closing portion is closed, an internal pressure in the tube between the two opening/closing portions is increased due to the further fold of the opening/closing portion, and the tube pump transfers the fluid using the increased internal pressure in the tube.

Therefore, the subject-matter of claim 21 is new (Article 33(2) PCT).

V-4 The problem to be solved by the present invention may be regarded as how to provide a tube pump, of the type in which the fluid is transferred by folding/unfolding the tube elastically, having an alternative construction and a different mode of operation. The main distinguishing feature, which is present in all three independent claims 1, 14 and 21, with regard to the tube pump in D1 is that the fluid is transferred by using the increased internal pressure in the tube between two opening/closing portions.

The solution to the problem proposed in claims 1, 14 and 21 of the present application is considered as involving an inventive step (Article 33(3) PCT) because there are no indications in the prior art that would prompt to the skilled person to adapt or modify the tube pump of D1 to arrive at something falling within

the terms of any of these claims.

- V-5 Claims 2-13, 15-20 and 22 are respectively dependent on claims 1, 14 and 21 and as such also meet the requirements of PCT with respect to novelty and inventive step.
- V-6 To satisfy the conciseness requirement of Article 6 PCT the set of claims should include only the minimum necessary number of independent claims. Said requirement is not satisfied by claims 1, 14 and 21, as in the present case it is considered appropriate to use only one independent claim.
- V-7 The terms used in claim 1 "the opening/closing portion" (last line but one of claim 1) are unclear because they do not exactly define which one of the two opening/closing portions aforementioned in claim 1 is meant, thereby rendering the definition of the subject-matter of said claim unclear, Article 6 PCT. As far as the claim 1 can be understood it seems however to meet the requirement of Article 33 PCT.
- V-8 According to the content of the description, it appears that claim 22 should be dependent on claim 21 and not on claim 20 as it can be read therein.
- V-9 The following objections are also raised:
- a) The independent claims are not properly cast in the two part form, with those features which in combination are part of the prior art (see D1) being placed in the preamble, contrary to the requirements of Rule 6.3(b) PCT.
 - b) The features of claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).